

A STUDY TO ESTIMATE JUVENILE SALMONID SURVIVAL THROUGH THE COLUMBIA RIVER ESTUARY USING ACOUSTIC TAGS, 2008

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ABSTRACT

The study Objectives in 2008 were:

- 1) Estimate yearling and subyearling Chinook salmon survival from Bonneville Dam through the mouth of the Columbia River.
- 2) Quantify and compare latent effects of FCRPS passage history on mortality of emigrant juvenile yearling and subyearling Chinook salmon from Bonneville Dam downstream.
- 3) Monitor and map estuary migration pathway and habitat associations, and relative behaviors.
- 4) Determine the fate of subyearling Chinook salmon that cease their migration in the Columbia River downstream from Bonneville Dam.
- 5) Estimate survival probabilities for yearling and subyearling Chinook salmon within the plume.
- 6) Competitively procure prototypes of “rearing Chinook” acoustic micro-transmitters for function and biocompatibility evaluation.
- 7) Determine the capability and reliability of the JSATS cabled (hard-wired) array.

Progress to date (11/25/2008) relative to the above objectives is summarized below. The results presented should be considered preliminary and subject to change pending further analyses.

Objective 1; analyses are ongoing. Preliminary 2008 survival estimates from Bonneville Dam tailrace to the mouth of the Columbia River were for yearling Chinook salmon averaged 0.785 (range = 0.65 to 0.94) and for subyearling Chinook salmon averaged 0.83 (range = 0.64 to 0.93). The largest loss appeared to occur in the lower 35 km of the river for yearlings and the lower 50 km for subyearling Chinook salmon. The joint probability of migration and survival was much higher later in the season for subyearling Chinook salmon in 2008 than in the previous three years.

Objective 2; analyses are ongoing. Passage route assignments of fish passing JDA and Bonneville Dam from JSATS detections as well as PIT detections in the Juvenile Fish Bypass (JFB) at JDA and BON and Corner Collector at BON will be used to form experimental groups for survival comparisons.

Objective 3; analyses are ongoing. Migration pathways of 7,926 yearling and 6,751 subyearling Chinook salmon and 2,820 steelhead released for this study and other studies regrouped passing through the Bonneville Dam tailrace or at Rkm 86 (Oak Point) were determined for estuary island side channels and well off the navigation channel into Gray's Bay in the freshwater tidal portion of the Columbia River Estuary. An average of 8% of the yearling Chinook salmon detected of the yearling Chinook salmon were detected in the estuary islands while 8% were detected in Gray's Bay. More subyearling Chinook salmon were detected in the islands (13%) and Gray's Bay (14%). Steelhead were also detected in these non-main-channel migration areas; with 8% detected in the islands and 5 % detected in Gray's Bay.

Objective 4; this objective will be addressed in the presentation by Lynn McComas on the mobile tracking efforts.

Objective 5; This objective was not funded in 2008, however a separate R&D effort developed and tested a prototype plume and near-ocean receiver that was successfully deployed and tested in 100 m-deep water off the Columbia River Plume.

Objective 6; This objective produced a prototype transmitter weighing 0.30 g in air. This prototype transmitter has been used in preliminary evaluations of bioeffects in a laboratory setting.

Objective 7; this objective will be addressed in the presentation by Lynn McComas on the mobile tracking efforts.